

CLAIMS

What is claimed is:

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1. A method of delivering a nucleic acid of interest to a primary human chondrocyte, comprising
providing a recombinant adenovirus having a tropism for primary human chondrocytes, said recombinant adenovirus comprising a nucleic acid of interest; and
infecting a primary human chondrocyte with said recombinant adenovirus, such that said nucleic acid of interest is delivered to said primary human chondrocyte.
 2. The method of claim 1, wherein said recombinant adenovirus is a chimeric adenovirus.
 3. The method of claim 1, wherein said recombinant adenovirus comprises a deletion in a gene encoding for fiber protein which is replaced by a nucleic acid sequence encoding an amino acid sequence having a tropism for primary human chondrocytes.
 4. The method of claim 1, wherein said tropism is provided by at least a tropism determining part of an adenoviral fiber protein of a B-type adenovirus.
 5. The method of claim 4, wherein said fiber protein is derived from an adenovirus type 16, 35 and/or 51.
 6. The method of claim 2, wherein said recombinant adenovirus comprises an adenovirus 5 nucleic acid sequence.
 7. The method of claim 5, wherein said recombinant adenovirus comprises an adenovirus 5 genome.

8. The method of claim 2, wherein said recombinant adenovirus comprises at least one deletion in the E3 region where a nucleic acid of interest is inserted or can be inserted.

9. The method of claim 2, wherein said recombinant adenovirus comprises at least one deletion in the E2 and/or E4 region where a nucleic acid of interest is inserted or can be inserted.

10. The method of claim 1, wherein said nucleic acid of interest encodes at least one amino acid sequence that inhibits cartilage disease progression and/or at least one amino acid sequence that counteracts the loss of cartilage.

11. The method of claim 1, wherein said nucleic acid sequence of interest encodes at least one member of the family of bone morphogenesis proteins.

12. A gene delivery vehicle for delivering a nucleic acid of interest to a primary human chondrocyte, comprising a recombinant adenovirus having a tropism for primary human chondrocytes.

13. The gene delivery vehicle of claim 12, comprising a nucleic acid sequence encoding at least one amino acid sequence that inhibits cartilage disease progression and/or at least one amino acid sequence that counteracts the loss of cartilage.

14. The gene delivery vehicle of claim 12, comprising a nucleic acid sequence that encodes at least one member of the family of bone morphogenesis proteins.

15. The gene delivery vehicle of claim 12, wherein said recombinant adenovirus is a chimeric adenovirus.

16. The gene delivery vehicle of claim 15, wherein said recombinant adenovirus comprises a deletion in a gene encoding for fiber protein which is replaced by a nucleic acid sequence encoding an amino acid sequence having a tropism for primary human chondrocytes.

17. The gene delivery vehicle of claim 10, wherein said tropism is provided by at least a tropism determining part of an adenoviral fiber protein of a B-type adenovirus.

18. The gene delivery vehicle of claim 14, wherein said fiber protein is derived from an adenovirus type 16, 35 and/or 51.

19. The gene delivery vehicle of claim 12, wherein said recombinant adenovirus comprises an adenovirus 5 nucleic acid sequence.

20. The gene delivery vehicle of claim 19, wherein said recombinant adenovirus comprises an adenovirus 5 genome, having at least a deletion in its E1 region where a nucleic acid of interest is inserted or can be inserted.

21. The gene delivery vehicle of claim 15, wherein said recombinant adenovirus comprises at least one deletion in the E3 region where a nucleic acid of interest is inserted or can be inserted.

22. The gene delivery vehicle of claim 15, wherein said recombinant adenovirus comprises at least one deletion in the E2 and/ or E4 region where a nucleic acid of interest is inserted or can be inserted.

23. The gene delivery vehicle of claim 12 for use as a pharmaceutical.

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24. Chondrocytes provided with an additional nucleic acid encoding at least one amino acid sequence that inhibits cartilage disease progression and/or at least one amino acid sequence that counteracts the loss of cartilage, said additional nucleic acid being provided by a gene delivery vehicle of claim 12.

25. The chondrocytes of claim 24 wherein said additional nucleic acid encodes at least one member of the family of bone morphogenesis proteins.

26. A pharmaceutical comprising a gene delivery vehicle of claim 12.

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27. A method of inhibiting cartilage disease progression comprising:
preparing a recombinant adenovirus having a tropism for primary human chondrocytes, said recombinant adenovirus including a nucleic acid of interest; and
infecting a primary human chondrocyte with said recombinant adenovirus, such that said nucleic acid of interest is expressed in said primary human chondrocyte, inhibiting cartilage disease progression.

28. A method of repairing cartilage comprising:
preparing a recombinant adenovirus having a tropism for primary human chondrocytes, said recombinant adenovirus including a nucleic acid of interest; and
infecting a primary human chondrocyte with said recombinant adenovirus, such that said nucleic acid of interest is expressed in said primary human chondrocyte, effecting the cartilage repair.